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## ABSTRACT

To better understand ways to improve education, large longitudinal data sets are required, such as the National Education Longitudinal Study of 1988 which follows students through their schooling and into the labor market. In addition, data comparing the performance of state and local school systems is essential for educational accountability. The following data collection activities are needed: (1) data that accurately compare states and local education agencies; (2) measures of educational outcomes; (3) achievement test scores by subject, age group, minority status, and state; (4) performance on minimum competency tests for high school graduation and changing requirements, by state; (5) changes in test performance of particular cohorts, by state; (6) achievement test scores and gains, adjusted for each state's population demographics; (7) assessment of higher order cognitive skills; (8) international comparisons; (9) assessment of study habits; (10) assessment of locus of control; (11) measures of the economic outcomes of schooling; and (12) development of causal models of educational improvement. Additional data would also improve NCES's Current Population Survey on attendance and completion of schooling. (GDC)

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DATA COLLECTION FOR IMPROVING ELEMENTARY/SECONDARY EDUCATION

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## I. INTRODUCTION AND SUMMARY

Since education is a local responsibility, the purpose of federal data collection is to help the citizenry and political leadership of individual states and localities to make better decisions. Better decision making at the local level requires two things (1) better understanding of how schools influence learning and how effective schools develop and evolve and (2) comparative data on the performance of state and local educational systems so the citizenry and public officials can hold local school administrators accountable. The collection and publication of data is a public service that benefits everyone in the country and thus is properly a federal function.

Achieving the first goal--better understanding of how to improve education--requires large longitudinal data sets like the National Education Longitudinal Study of 1988 (NELS88) which follow students through their schooling and into the labor market. What is needed is large data sets which merge many different kinds of data:

- achievement tests for a great variety of subjects (not just one subject at a time) which have separate subtests for higher order skills and basic skills
- aptitude tests
- school records on courses taken, grades, absenteeism, descriptions of special education service received, and test scores
- questionnaires measuring student background and attitudes (i.e., locus of control)
- parent questionnaires
- surveys of the students, teachers, guidance counselors and principals
- multiple administrations of tests and surveys about 2 to 4 years apart
- follow-up data on labor market outcomes with complete histories of employment and unemployment up to age 40
- interviews with employers to measure skills and job performance of recent school leavers.

The public needs to be able to monitor the progress and achievements of their state and local systems of education. The logical point of comparison is

the progress and achievements of other states so the primary focus of NCES's core data program should be on providing data that is comparable across states. Emphasis should be placed on measuring outcomes rather than inputs. The key data elements that need to be added to the program are the following:

- Performance on achievement tests in a variety of subjects that all (or almost all) students in the school take. (It is feasible to put different tests on a common metric and the effort should be made.)
- Comparisons of a states relative performance in tests for first graders with performance in later grades. (This is a better measure of educational effectiveness than mean test scores which are heavily effected by the social background of the student body.
- Separate test scores for basic and high level skills.
- State comparisons of the economic outcomes of schooling: earning, employment, occupation.
- Time series and regional data on salary offers to recipients of associates degrees by area of study.
- Time series and regional data on the economic outcomes of schooling from an improved Current Population Survey.
- Time series and regional data on how schools influence the development of character (e.g., locus of control).
- International comparative data on achievement in particular subjects and on time use.

## II. NEED FOR DATA THAT ACCURATELY COMPARES STATES AND LOCAL EDUCATION AGENCIES

Responsibility for and administration of elementary/secondary education lies in state, local and private hands. It is important to remember this fact when planning a federally sponsored system of data collection on elementary and secondary education. The primary purpose of the common core data program is, therefore, not to help the federal government make better decisions but to help the citizenry and political leadership of individual states monitor the progress and achievements of the educational system in that state. Progress and achievements can be defined only when some standard of comparison is available. Since the natural point of comparison is the progress and achievements of other states, the key requirement for the common core data program should be the accuracy of the across state comparisons of the levels (e.g., expenditure per pupil in average daily attendance) or changes (e.g., changes in performances on standardized tests) in various indicators of effort and performance.

In order to effectively manage their responsibilities on a day-to-day basis, state governments and local educational agencies (LEAs) need timely and accurate data on enrollment, staff, revenues, and expenditures for each of the schools and school districts under their charge. From the point of view of the state and local administrators, the primary requirement on management information system (MIS) data is comparability across schools and school districts, consistency over time and accuracy (conformity to the definitions and concepts used in that state's educational legislation and administrative regulations). When state legislation changes, the data that needs to be collected will change and consistency over time will be set aside in favor of accuracy.

Historical accident and different needs for data have resulted in MIS data that differ in concept and accuracy from state to state. Constructing valid estimates of national statistics through the aggregation of MIS data is, thus, no easy matter. Since estimates of national aggregates can be obtained where necessary by other means (e.g., sample surveys), the common core data program should not have the estimation of national aggregates as its central goal. The central goal of the common core data program should instead be to provide high quality data that are comparable across states. This implies that NCES needs

to work cooperatively with the states to insure that data reported are consistent with the common definitions that have been adopted. If, however, specific data elements from some states are not comparable to the data from most other states, the data element should either not be published or be published in italics with a footnote describing reasons for the lack of comparability. When this occurs national aggregates should be reported only for the states that have provided comparable information.

### III. THE NEED TO MEASURE EDUCATIONAL OUTCOMES

The statistics reported in The Digest of Educational Statistics and The Condition of Education are almost entirely measures of inputs into education rather than measures of the outcomes of education. Of the 70 tables in the 1984 edition of The Condition of Education, only 3 displayed data on test score outcomes of education and none displayed data on economic outcomes of education. A categorization of the tables in The Digest of Educational Statistics (see table 1) reveals that it did only slightly better in covering educational outcomes. Of the 173 tables in the 1983/84 edition, there were 9 tables displaying test score outcome data and 9 displaying data on economic outcomes (labor force status, occupation and earnings). The tests covered material that should be learned before entering college so all 9 of these tables can be considered outcome measures for elementary and secondary education. Of the 9 tables displaying data on economic outcomes, 3 tables addressed the experience of bachelor degree holders, 1 the experience of recipients of masters and Ph.D. degree holders, 3 the experience of high school graduates and dropouts and 2 tables presented data on all levels of educational attainment. There were no tables devoted to data on the labor market success of completers of 1 or 2 year occupational programs or associates degree holders. There were 3 tables on high school diplomas awarded and 4 tables on years of schooling completed. These, however, are measures of credentials awarded not of learning. The great variation in the educational standards across the country and the decline in standards over time call into question the usefulness of these statistics for comparisons across time and space of the performance of the educational system.<sup>1</sup>

Table 1 also presents data on changes over time in the subjects covered in The Digest of Education Statistics. The number of tables devoted to the economic outcomes of schooling has been stable over time. The number of tables providing test performance data rose from 2 in 1969 to 9 in 1983 due to the availability of data from the National Assessment of Educational Progress.

#### The Effects of Data Availability

There are important interactions between data availability and the evolution of public policy. Statistical agencies respond (often with a considerable

TABLE 1  
COVERAGE OF THE DIGEST OF EDUCATIONAL STATISTICS

|                                           | 1969 |       | 1975 |       | 1983 |       |
|-------------------------------------------|------|-------|------|-------|------|-------|
|                                           | Nat. | State | Nat. | State | Nat. | State |
| <u>Educational Outcomes</u>               |      |       |      |       |      |       |
| Economic Outcomes                         | 9    | 0     | 11   | 0     | 9    | 0     |
| Test Score Outcomes                       | 1    | 1     | 5    | 0     | 9    | 0     |
| <u>Educational Credentials and Inputs</u> |      |       |      |       |      |       |
| Credentials & Yrs of School Completed     | 3    | 5     | 5    | 3     | 4    | 3     |
| Elementary Secondary Education Inputs     | 30   | 21    | 23   | 21    | 21   | 24    |
| All Levels Inputs                         | 11   | 2     | 12   | 3     | 6    | 2     |
| Higher Education Degrees                  | 4    | 2     | 10   | 2     | 19   | 1     |
| Higher Education Inputs                   | 36   | 13    | 35   | 11    | 31   | 14    |
| Adult & Vocational Education              | 0    | 0     | 9    | 1     | 6    | 2     |
| Federal Programs                          | 5    | 2     | 6    | 3     | 3    | 4     |
| International Education                   | 6    |       | 6    |       | 8    |       |
| Libraries                                 | 7    | 1     | 8    | 2     | 5    | 2     |
| R&D                                       | 6    |       | 7    |       | 0    |       |
| Equal Educational Opportunity             | 5    |       | 2    |       | 0    |       |
|                                           | 123  | 47    | 139  | 47    | 121  | 52    |
|                                           | 170  |       | 186  |       | 173  |       |

Odd numbered columns are counts of tables which present data for the nation as a whole. Even numbered columns are counts of tables which present data comparing states or in a few instances specific institutions of higher education or libraries. Input data includes information on students, staff, revenues, and expenditures.

lag) to the concerns of policy makers, but in addition, data availability has independent effects on the evolution of public policies.

The availability of statistics recording progress over time and providing geographical comparisons attract public and policy maker attention to a subject. The availability of data on inputs--numbers of students, numbers of teachers and expenditure--and the lack of data on outcomes contributed to an unfortunate tendency during the 60s and 70s for public attention and policy analysis to focus on a limited number of measureable inputs into learning rather on its outcomes.

The Nation at Risk report has made the quality and effectiveness of education the central educational policy question of the 1980s. The kind of data included in government publications is changing as a result. But it is doubtful that the National Commission on Excellence in Education would have had such an impact (and might not have even been appointed), if there had not been data available on (1) declining SAT scores and performance on NAEP exams and (2) the poor relative performance of American students in math and science in the International Education Agency's studies. The future of the educational reform movement will also be influenced by data availability. Since policy is made at the state and local level, there is a great need for performance measures that are specific to particular states and comparable across states and over time.

#### Test Score Outcome Data

The Department of Education has begun the process of supplying the need for comparative data on educational performance by making data on state means on the ACT and SAT scores and their changes over time widely available (Wall Chart and Indicators). The SAT and ACT tests, however, are curriculum free tests of aptitude for college and as such are not appropriate goals for instruction. They are also limited to college bound students. It is important that states be able to monitor their progress towards achieving instructional goals for all their students and across all grade levels.

Consequently, high priority should be given to publishing data on the following:

1. Performance on Achievement tests by subject, by age group (or grade), by minority status and by state. Many states mandate that all students in the state take particular achievement

tests at specified points in their educational career. The problem is that different states use different tests. A study of the feasibility of linking together the various widely used achievement tests has been funded so a methodology for making the results comparable across most states will be available soon. Disaggregation by subject is important because it helps states monitor curriculum reforms that are specific to particular subjects.

2. Performance on competency tests necessary to receive a high school degree and how that has changed over time.

Consideration should also be given to publishing similar statistics for the larger urban school districts.

Colleges also need to be made accountable; therefore, data on the academic performance of their students need to be published. This could be accomplished by publishing Graduate Record Exam, SAT and ACT test scores for individual colleges and for all of the colleges in a state disaggregated by type of institution. Since the mean score will depend on the proportion of a college's graduates which take the Graduate Record Exam, it would be essential to publish this proportion along with the score.

Statistics like those in the wall chart titled State Education Statistics and those described above will inevitably be used to answer questions like "How are we doing relative to other states?" The public and elected officials will use such numbers to assess the effectiveness of the educational system in their state and to monitor the progress of state reform efforts. The publication of the wall chart suggests such uses are intended.

There are dangers, however. Some states are apparently planning to use the mean test scores for school districts as a very powerful tool of oversight.

In the past year, four states--Arkansas, Kentucky, South Carolina, and Texas--have included provisions for academic bankruptcy in their reform bills. The bills in all four states ask that local school districts meet certain minimum levels of student achievement and other standards or face the possibility that the state will mandate additional reforms for the district, even including wresting control of the local school system from the local school board--the academic equivalent of putting the district into receivership. (Anderson and Pipho, 1984; p. 211)

If decisions of this magnitude were to be made without taking into account the demographic background of the students in the district, great injustices could

be done. While state comparisons of performance could not conceivably lead to the federal government imposing changes on a particular state's educational system, they might have powerful political consequences. For example, they could influence the outcome of an election for State Superintendent of Public Instruction.

Comparisons of SATs, ACTs or achievement test scores across states probably reflect racial and social background differences of their population more than they reflect the quality of the schools in that state. Policy makers and the public need a statistic for comparing the performance of state educational systems that is less subject to such biases. Comparative data that purport to measure the performance of an educational system but in fact measure the talents and background of the students could confuse the public debate on education more than they enlighten it. Only a tiny minority of the users of such statistics will be sophisticated statisticians or educational researchers who will estimate multivariate models that control for the student background characteristics. Consequently, the data needs to be reported in ways which make the comparisons across states as fair and valid as possible. It is therefore essential that someone (NCES, NIE or a researcher under contract) be given the task of producing performance indicators that adjust for the social background of the students and the talents they bring with them at school entrance. The following should be considered:

3. Changes in the relative performance of particular cohorts of children from particular states. Such a statistic can be constructed by putting scores from tests administered in the first and later grades on a common metric (e.g., standard deviation units, grade equivalents or state rankings) and then examining how the states performance on this ranking changes as grade level increases. While such comparisons might be made for different tests given at a point in time, comparisons would be more valid if the cohort was held constant. This would be done by calculating state rankings on 1st grade scores in 1976 and then comparing them to the rankings on 8th grade scores in 1984. Grade equivalents and standard deviation units will produce different results. If grade equivalents are to be reported, standard deviation units should be reported as well and the difference between the two should be explained.
4. Achievement test scores (levels and gain scores) that have been adjusted for the demographic composition of the states students. Another way of reducing the bias problem discussed above is to estimate statistical models predicting achievement as a function of student background characteristics using state

aggregate data and then report only the residuals from such a model.

### Assessing Higher Order Skills

Even though most basic skills should be learned prior to the end of junior high school, many students arrive in high school without a through grounding in basic skills. This fact and great public stress on the importance of basic skills seems to have resulted in high school teachers coming to view the teaching of basic skills as their number one goal. When 10,360 high school teachers surveyed as part of the HSB supplementary survey were asked to rank 8 different goals of their teaching, 44 percent placed "Basic literacy skills" at the top (see table 2). Only 19 percent gave first rank to "Academic excellence or mastery of the subject matter of the course." High school should be a place for developing higher order skills and reasoning ability such as inference, analysis, interpretation, and applying general principals to specific cases. The growth of testing and the tendency of most tests to focus on lower rather than higher order skills may be contributing to a narrowing of the high school's teaching agenda. The National Council of Teachers of Mathematics is concerned about this trend and has called for a revision of both the mathematics curriculum and the tests used to assess progress. It recommended that:

- "Problem solving be the focus of school mathematics in the 1980s
- Basic skills in mathematics be defined to encompass more than computational ability
- Stringent standards of both effectiveness and efficiency be applied to the teaching of mathematics
- The success of mathematics programs and student learning be evaluated by a wider range of measures than conventional testing" (National Council of Teachers of Mathematics, 1980; p. 1)

Similar problems exist in other subject areas.

Testing can be designed to assess higher order skills. The recent revision of The California Achievement Tests had better assessment of higher order skills as an important objective. The College Board and The National Assessment of Educational Progress have successfully implemented standardized methods of assessing writing ability. An effective way to insure that we do not forget

TABLE 2  
THE GOALS OF SECONDARY SCHOOL TEACHERS

|                                                                                  | Rank |    |    |    |    |    |    |    |
|----------------------------------------------------------------------------------|------|----|----|----|----|----|----|----|
|                                                                                  | 1    | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| Basic literacy skills (reading, math, writing, speaking)                         | 44   | 18 | 12 | 8  | 7  | 6  | 4  | 2  |
| Academic excellence, or mastery of the subject matter of the course              | 19   | 18 | 16 | 12 | 11 | 9  | 9  | 6  |
| Citizenship (understanding institutions and public values)                       | 4    | 7  | 9  | 12 | 16 | 21 | 22 | 9  |
| Specific occupational skills                                                     | 4    | 5  | 7  | 8  | 9  | 12 | 21 | 35 |
| Good work habits and self-discipline                                             | 18   | 28 | 22 | 14 | 9  | 5  | 3  | 1  |
| Personal growth and fulfillment (self-esteem, personal efficacy, self-knowledge) | 13   | 14 | 16 | 19 | 16 | 13 | 7  | 3  |
| Human relations skills (cultural understanding, getting along with others)       | 6    | 10 | 13 | 17 | 20 | 18 | 12 | 4  |
| Moral or religious values                                                        | 9    | 6  | 6  | 7  | 9  | 11 | 17 | 35 |

NOTE: Cell entries are the percent of teachers who assigned the goal a given rank. Except for rounding error each row should sum to 100. Columns sometimes sum to more or less than 100 because some teachers gave different goals the same rank.

The question was: "If you had to choose from among the eight goals for students listed below, how would you rank them according to their importance in your teaching? Enter a "1" for the most important goal, a "2" for the next most important goal, and so on, through "8" for the least important goal. (FIRST, RANK EACH GOAL. THEN MARK THE MATCHING CIRCLE NEXT TO EACH RANKING.)"

about the need to teach higher order skills is to publish time series and state comparison data from tests and subtests that tap higher order skills.

### International Comparisons of Educational Performance

New data are becoming available comparing the academic performance of students in different countries. NCES should make sure that the results of these studies are accessible to educational policymakers.<sup>2</sup> A start has been made by including data from the Second International Mathematics Study in Indicators of Education Status and Trends. The following additional tables of International comparison data should be included in one of NCES's publications:

- Mathematics
  - comparisons of performance disaggregated by whether the item taps computational skills or problem solving ability;
  - the performance of students from each country that participated in the 2nd International Mathematics Study;
  - the changes in math performance between the first and second mathematics studies in the U.S. and other countries disaggregated by subject and by whether the item taps computational skills or problem solving.
- Science--The Second International Science Study
  - comparisons separately for biology, chemistry, physics, earth science, etc. and separately by whether the item asks for a fact or the use of higher order skills;
  - comparisons of the changes between the 1st and 2nd International Science Studies disaggregated in the same way
- Reading Comprehension (Thorndike, 1973)
- Literature (Purses, 1973)
- Civic Education (Torney, Oppenheim, and Farnen, 1975)
- Civic Attitudes (Oppenheim and Torney, 1975)
- Comparisons of Grade 1 and Grade 5 students in the U.S., Japan and Taiwan (Stevenson, 1983).

There is also a need for the publication of data on the school input and processes and environmental variables that may be accounting for the differences between countries in achievement.

- Time Engaged in Study of Particular Subjects (over the course of a student's academic career)
- Time on Task (percent of time in the school that is actually spent engaged in learning) Stevenson (1983) reports observational data on classroom time on task and parent child interaction for U.S., Japan and Taiwan.
- Time Spent Watching TV
- Number of Books Read
- Other Measures of Educational Process and Outcomes
- Measures of the Economic Outcomes of Schooling

The role of NCES and NIE in international comparative studies should be to stimulate others (e.g., the appropriate NIE Centers) to undertake such studies and to provide grant support for researchers engaged in such research. Probably the most critical need at present is for the collection of internationally comparable time use data for both children (in and out of school), parents and other adults (Stevenson, 1983; Stafford and Duncan, 1980; and Juster and Stafford, forthcoming).

#### Assessing Work Habits and Self Discipline

High school teachers ranked "good work habits and self discipline" as their number two goal (see table 2). Sixty-eight percent of the teachers reported it ranked among the top three of their teaching goals. Only 53 percent placed academic excellence in the top three and 43 percent awarded top three status to personal growth and fulfillment. Amatai Etzioni has said

Thus, the root problem is not that millions of high school graduates have great difficulties in reading, writing, and arithmetic; these all-too-common deficiencies are consequences of insufficient self-discipline, of inadequate ability to mobilize self and to commit. These graduates enter the adult world twice handicapped. They suffer both from continued psychic underdevelopment and from the inadequate cognitive preparation this underdevelopment helped to cause. (Etzioni, 1984; p. 18)

When 167 employers in the Los Angeles area were asked what was the most important factor in job success, 63 percent picked "good work habits," 23 percent picked "technical job skills," and only 14 percent picked "linguistic and computing ability" (Wilms, 1983).

Clearly it is important to keep track of how well our schools are developing good work habits and self discipline. High School and Beyond contains a number of questions about study habits, class cutting, having work done on time, tardiness, attitudes toward study and beliefs about one's ability to control one's fate (self efficacy) that can be used to assess character traits. NCES publications should present some of this data and where possible make comparisons with the Class of 1972 data. It is important that these items be retained in NEL88 and that there be no changes in wording.

### Self Efficacy

The locus of control or personal efficacy scale measuring the belief that one's future is controlled by one's actions is probably the best documented and most researched of the sociopsychological scales contained in HSB. It probably has a stronger correlation with what Etzioni is referring to as self discipline than any other widely used scale. The scale fits nicely into economic theory, for it can be interpreted as a measure of the perceived risk and uncertainty surrounding the consequences of one's actions. There is a well documented positive correlation between self efficacy--believing that one controls one's own fate--and labor market success. The analysis of longitudinal data containing repeated measures of self efficacy and labor market outcomes has shown that an important part of this association is a consequence of self efficacy's impact on employment and wages rather than the reverse (Andrisani, 1978; Duncan and Morgan, 1979). Kang and Bishop's (1985) analysis of followup data on HSB seniors found that self efficacy measured in the senior year had a larger impact on wages and employment in the 2 years after graduation than test scores, grades and virtually all other school items except curriculum and employment during high school. A one standard deviation rise in self efficacy raised earnings of women by 8.1 percent and the earnings of men by 6.7 percent.

Not surprisingly self efficacy also has important effects on learning. Using a cross lagged design in which senior test scores were a function of sophomore self efficacy, department, educational and occupational plans, self esteem and performance on verbal, math, science and social science tests and a host of other background variables, Hotchkiss (1984) found that a one standard deviation improvement in efficacy increased the verbal and civics test score of

seniors by 6 percent of a standard deviation and the science test by 5 percent of a standard deviation.

Hotchkiss (1984) has also demonstrated that schools have important impacts on the development of self efficacy. In analysis of HSB longitudinal data in which self efficacy as a senior was modeled as a function of self efficacy as a sophomore, a long list of individual characteristics and a vector of school dummies it was found that school dummies exercised significant effects. The multiple partial correlation indexing the impact of the school attended was two-thirds the size of analogous multiple partial indexing the combined effects of personal characteristics and socioeconomic background.

These results suggest that self efficacy deserves an important role in theories of learning and in theories of occupational choice and career attainment. The results cited above should be viewed only as preliminary forays into the development of such theories. Almost nothing is known about how schools and teachers foster a sense of self efficacy. NELS88 will be a much better data set studying these processes than HSB.<sup>3</sup> Consequently it is critical that the self efficacy scale remains in NELS88.

#### Measuring the Economic Outcomes of Schooling

Improved performance on tests of cognitive ability and greater achievement in core academic subjects are not the only goals of elementary and secondary education. Raising the employability of youth is another important goal. The National Commission on Excellence in Education justified its recommendations for reform in part by the following:

Knowledge, learning, information, and skilled intelligence are the new raw materials of international commerce and are today spreading throughout the world as vigorously as miracle drugs, synthetic fertilizers, and blue jeans did earlier. If only to keep and improve on the slim competitive edge we still retain in world markets, we must dedicate ourselves to the reform of our educational system for the benefit of all--old and young alike, affluent and poor, majority and minority. Learning is the indispensable investment required for success in the "information age" we are entering. (p. 7)

If schooling influences the productivity of the work force as the National Commission claims, then people with greater amounts and higher quality education will be more likely to find good jobs that pay higher wage rates.

Research on the links between schooling and later success in the labor market have found that test scores have rather small impacts on employment and wage rates (Bishop, 1985) and that improved performance on standardized tests accounts for only a small part of schooling's total impact on labor market success (Olneck and Bills, 1982). Vocational education has work attitudes, job readiness and occupational skills as explicit goals and the time devoted to developing these abilities may reduce the time devoted to the traditional academic subjects. Consequently, data on the economic outcomes of elementary and secondary education are essential.

Experience with the Vocational Educational Data System suggests that the schools probably cannot be expected to collect and report data on the economic success of their graduates that is comparable across schools and across states. Data on economic outcomes must therefore be obtained from the Current Population Survey, the Census, longitudinal surveys like NLS, and organizations like the College Placement Council.

#### Survey of Salary Offers to Associate Degree Recipients

The College Placement Council collects data from the placement offices of colleges and universities on the offers received by B.A., M.A., and Ph.D. degree recipients. Northwestern University's Endicott survey publishes similar data obtained from a survey of employers. There is no comparable national survey of salary offers to the completers of two-year associate degree or one-year certificate programs. The Middle Atlantic Career Counseling Association (MACCA) has been collecting these data on salary offers received by recipients of the Associates Degree from about forty 2 year colleges in their six-state area for the last ten years. Their data cover about one-sixth of the nation. Data from the VED system is inadequate because the lag in reporting salaries is too long and because salary data was not obtained separately for training programs of different length.

After getting support from the American Associations of Community and Junior Colleges (AACJC), MACCA and other interested groups NCES should contract with the College Placement Council (or an organization like the National Center for Research in Vocational Education) to conduct a salary offer survey in as many 2 year institutions as are willing to participate. Placement officials at participating institutions would report on the job offers received by graduates

they provide placement services to. The more rapidly such information is disseminated the more valuable it is so semiannual reports should be released. Since the labor markets for AA recipients are regional separate reports should be published for each of the 10 census regions. The cost of such a data collection effort would be under \$100,000.

#### New Tables Based on Existing CPS Data: Time Series

The tables in the 1983/84 Digest are useful and should be retained. There is a need for new tables, however, that provide comparisons over many years of labor market success (employment, occupation, and earnings) for recent school leavers. The data proposed would provide a means of tracking whether the decline in SAT scores and other indicators of academic achievement have resulted in a parallel decline in the quality of the jobs obtained by recent high school graduates and a rise in their unemployment rates. The following tables are recommended.

1. Unemployment rates and employment to population ratios of young people who graduated from or dropped out of high school during the previous year and are not enrolled in school (see table C43 of Labor Force Statistics Derived from the CPS: A Data Bank, 1982). If possible separate scores for blacks and for single females should be published. The table should also contain an unemployment rate for prime age (25-55) males and for prime age females as a point of comparison.
2. Indicators of the quality of jobs obtained by recent high school graduates and dropouts. The following are recommended:
  - Industrial Composition
    - share of jobs in manufacturing, mining, construction, transportation and public utilities
    - share of jobs in government
    - share of jobs in wholesale retail or service
  - Occupational Composition
    - share of jobs in laborers or service occupations
    - share of jobs in operative occupations
    - share of jobs in clerical occupations
    - share of jobs in sales occupations

These data should be presented both for those who graduated and those who dropped out of high school the previous year, and for all 18-24 year old high school graduates not enrolled in college and for all 18-24 year old high school drop outs.

3. Average yearly earnings of young people not enrolled in school categorized by educational attainment. Three age groups should

be reported: 18-24, 25-34 and 35-65. The educational attainment categories might be 0-11, 12, 13-15, 16 and 17+. Separate data should be provided by sex and for full time full year workers. In order to accentuate the comparisons across educational levels, the information could be presented as ratios to the earnings of high school graduates (real dollar amounts of earnings would be presented only for high school graduates). Tabulating these data for recent school leavers and comparing it to average weekly earnings of other groups will provide a measure of the relative labor market success of those who have recently completed their schooling.

4. Unemployment rates for people categorized by education and by age (e.g., 18-24 and 25-65).

Data on the labor market behavior of students is also important, though not as critical as data on recent school leavers. High school and college students spend a great deal of time working.<sup>4</sup> These jobs have both good and bad effects on educational outcomes. They help finance college but they do so by often reducing the time available for study.

#### Improvements in CPS Data

NCES can greatly improve the usefulness and timeliness of data from the Current Population Survey's (CPS) October supplement on attendance and completion of schooling by arranging for the addition of the following questions:<sup>5</sup>

- usual weekly earnings (same wording as in the January and May supplements)
- highest degree or credential received
- whether school from which highest degree received was a 4 year college, 2 year junior or community college, or technical institute
- whether the school most recently attended (or from which highest degree was received) was public, Catholic, other religiously oriented private or sectarian private
- the students major or concentration at that school (for high school the categories might be the same as those in question 2 of the HSB senior questionnaire, greater detail would be obtained from those with some college or a college degree)
- whether the individual received special education services in elementary or secondary school and the type of handicap

- state in which high school was located
- state in which college was located

The addition of these 8 questions would greatly improve our ability to track changes over time in the economic returns to various types of schooling and to compare the effectiveness of schooling in different parts of the country. This small addition to only one month of the CPS would go a long way toward meeting the Congressionally mandated requirements for data on the outcomes of vocational education.

The monetary returns to college attendance and to majoring in specific fields vary over time due to shifts in demand and supply for the skills taught in these schools (Freeman, 1971; 1971a; 1971b). The monetary benefits of completing high school and of receiving different types of high school preparation also vary over time. Estimates of the impact of vocational education on the earnings of 1980 high school graduates (HSB) are considerably more positive than estimates in earlier cohorts (such as Class of 1972, the NLS Young Mens survey, and the NLS Youth Cohort) (Kang and Bishop, 1985; Meyer, 1982; Daymont and Rumberger, 1982). The change could be a result of improvements in the quality of vocational offerings but it might also have been a consequence of the unique economic environment that greeted 1980's high school graduates. Data from repeated CPS surveys are necessary if we are to distinguish long term trends in the return to vocational or other particular types of education from short run shifts due to the business cycle. The CPS obtains earnings information on a much larger sample (over 70,000 households) than other surveys available for studying the impacts of curriculum and private or public control of institution (e.g., NELs and NLS) and simultaneous analysis of data from more than one year increases the sample size even further. This feature means that CPS data can provide reasonably reliable estimates of economic outcomes for smaller subgroups (e.g., male graduates of Catholic high schools who did not go on to college or female vocational education students in nontraditional occupations). The cost of such a supplement would be about \$50,000 for data collection, another \$150,000 for programming, analysis and writing a report.<sup>6</sup> For this rather modest investment we would have data on the economic benefits of different types of schooling for more than 100,000 working adults. The cost would be under 2 dollars per person.

It is recognized that the classification of individuals by their majors or field of study would not be as reliable as the data that could be obtained from transcripts. Other longitudinal data sets which merge followup data on economic outcomes with high school and college transcript information and baseline measures of aptitude, academic achievement, and career plans would still be needed. These data sets cost at least 200 dollars per observation, however. To be useful there must be data on comparison groups (i.e., those who do not take vocational courses) as well as on those who complete the program that is the object of interest. Longitudinal studies like NELS88 cannot be conducted on the scale or with the frequency that would be needed to construct a reliable time series, to make comparisons between the larger states or to provide estimates of economic outcomes for subsets of the population. Consequently, important as the longitudinal surveys are for analyzing the effects of various educational programs the augmented CPS would be a useful supplement.

#### Comparing Economic Outcomes in Different States

Indicators of economic outcomes for specific states are also needed.<sup>7</sup> Differing economic climates need to be taken into account, so tables must be structured so as to highlight statistics that compare the labor market success of groups with differing amounts or kinds of education but subject to the same economic climate. The greatest need is for tables which describe how particular increases in educational achievement (e.g., graduation from high school, completing some college, completing a four year degree) improves one's labor market success in that state. Since most people find employment in the state where they complete their education, these tables will provide a measure (an imperfect one to be sure) of the economic payoff to that level of schooling in that state--something that should be correlated both with the quality and the labor market relevance of that level of schooling in that state.<sup>8</sup> Since the source of data for this would be the 1980 Census, the publication of this data would not need to be repeated each year. The tables that should be developed and made more accessible to state policy makers are the following:

- Earnings of different age groups (18-19, 20-21, 22-24, 25-29, 30-34, 35-44, 45-54, 55-64, 65+) by years of schooling completed by sex, by minority status and for all workers and full time full year workers. (Available in Table 237 of Detailed Population Characteristics of the 1980 Census.) The focus of the table

should be the earning ratios for people with differing educational attainment.

- Occupational and industrial distribution of people categorized by educational attainment, age, sex, and minority status.
- Unemployment rates and employment to population ratios by people categorized by educational attainment, age, sex, and minority status.

The usefulness of the 1990 Census for such comparisons would be greatly improved if questions were added on the field of study in high school and college, degrees received, state in which the individual attended high school, and state in which the individual attended college.

#### IV. NEED FOR DATA SETS FOR ESTIMATING CAUSAL MODELS OF EDUCATIONAL IMPROVEMENT

Probably the least controversial conclusion of effective schools research is that schools are institutions that have cultures (norms and expectations that students and teachers hold in common) which have powerful effects on how teachers teach and what students learn. Many of the most important outcomes of schooling--verbal ability, reasoning ability, self discipline, character, employability, ability to work as part of a team--are the result of the entire school experience and not something learned in particular courses. There is a need, therefore, for research that takes the school as a unit of analysis. Two very important issues need to be addressed.

- What is it about a school that causes students to learn more, to develop better character, or become more employable? Associations have been found between school climate and learning and lists of school effectiveness characteristics have been generated. The lists seem reasonable but the research that has generated them suffers from serious methodological weaknesses (Purkey and Smith, 1982).
- How are effective schools created? How does a school's ethos evolve? Since the school characteristics that are associated with school effectiveness are not under the direct control of a principal or school board, we need to describe the relationship between administrative actions and school climate.

##### Data for Studies of School Impacts on Learning, Character Development and Employability

The first issue can be addressed if a dataset has the following features

1. Longitudinal data on students while they are at school.
  - achievement test scores at various points in time
  - aptitude test scores
  - family background
  - educational and occupational plans
  - work habits, study habits, self discipline and self efficacy
  - courses taken from transcripts
  - career goals
2. Longitudinal data on students after they leave high school.
  - college attendance and completion
  - employment, wages, on-the-job training, productivity, job search and turnover

- crime and drug/alcohol abuse
  - career goals, locus of control and self esteem
  - job characteristics (e.g., cognitive complexity, autonomy, status)
3. Comprehensive description of the character of the school (inputs, processes, climate) while the student was at the school
- interviews with principal
  - interviews of teachers and other staff
  - aggregated responses of students describing school climate

The National Educational Longitudinal Survey of 1988 described in the February 1985 NELS88 Position Papers (Longitudinal Studies Branch, NCES 1985) has the three features necessary to support studies of how schools effect the learning, character development and labor market success of high school students. Below is a list of comments on specific aspects of the proposed design.

- Substituting data collection on entering college students for data collection on graduating high school seniors is recommended, for it makes study of college climate and teaching feasible. A survey of college teachers should be a part of the NELS88.
- An attempt should be made to follow up all of the NELS88 students after they leave school not just a sample. If cost is a deterrent, less frequent followups (e.g., at 3 year intervals rather than 2 year intervals) would be acceptable. Another alternative would be to drop the followup of recent college graduates and use followups of HSB and NELS88 instead.
- Many of the most important effects of a quality education do not appear until many years later. Followup should consequently be continued for 20 years. Once the cohort has reached the age of 24 the frequency of followup might be shifted to once every 5 years.
- School records should be accessed to obtain
  - courses taken
  - grades in specific courses
  - test score data on all widely used achievement, aptitude and minimum competency tests taken by the student for as far back in the students educational career as possible.
  - receipt of special education service and nature of disability
  - absenteeism
  - tardiness
- The teachers who are surveyed need to be selected in a manner which allows researchers to generalize either to a definable subset of secondary school teachers or to the entire population.

- Teacher assessments of individual students who are in the HSB survey are quite valuable. The checklist the teachers complete should include an item on locus of control.
- Consideration should be given to developing a data set which matches students to particular teachers. In a subset of schools arrangements could be made to track which teachers each student has over the course of high school. In these schools all teachers would be surveyed and the size of the student sample would be increased.
- The principal and guidance counselor should be asked whether they respond to employer requests for transcript information under two different circumstances; the student has signed a release form, the student has not signed a release form. Nationwide Insurance of Columbus Ohio sent more than 1,200 requests for transcript information with student releases to local high schools in 1982 and received only 93 responses. Not responding to such requests when former students have signed a release is a violation of the Family Educational Rights and Privacy Act of 1974.

#### Sophomore Baseline Questionnaire

- The locus of control (self efficacy) scale should be retained.
- Some students spend little time on homework because they find it easy to accomplish quickly. Others spend little time because they do not finish the assignments. Therefore it is important to ask what proportion of his/her homework assignments are completed and handed in on time.
- Drug and alcohol abuse is a serious barrier to learning and questions on these matters should receive high priority. I do not agree that these questions are too sensitive to ask in the sophomore survey. The questionnaire currently asks about being in trouble with the law.
- The proposed addition of new questions on disciplinary problems is a good idea.
- The question about when was the last time you worked (BB021) is not worded well: A question asking what proportion of the school year the student has been working is suggested to replace it.

#### Employment Data in Followups (applies to NLS72 and HSB as well)

- Continuous time employment histories as in HSB followups are very valuable and should be retained. The number of different jobs should not be limited to 4, however.
- The question on how you found this job is very valuable and it should be retained. There is evidence that for vocational students' informal recommendations by teachers are more effective than school placement services in finding jobs for students and

graduates (McKinney et al. 1980). A distinction between the two should be drawn by adding "Through a former teacher" to the list of alternatives. Finding a job through a friend or relative who works at the firm has an especially strong tendency to reduce turnover. The distinction can be drawn by using the following response categories "through a relative who worked at the firm, through a relative who did not work at the firm, through a friend who worked at the firm, and through a friend who did not work at the firm."

- The question on why you left the job should be retained, but involuntary terminations need to be disaggregated into:
  - fired
  - temporary or seasonal job
  - lay off not anticipated when hired.
- The question on training (51A-D and 52A-E of Second Followup of Seniors) should be asked for as many jobs as possible and especially for the first few jobs after leaving school. If a tradeoff is necessary, reduce the number of job satisfaction questions.
- The unemployment section is good and should be retained. It should include a question about receipt of unemployment insurance. A separate section should be developed to ask about the search process that led to the first job after leaving school the last time.
- Questions on tardiness, absenteeism and "goofing off" on the job that parallel similar questions about school behavior would be desirable.
- Wage rates do not fully capture the productivity impacts of a good education. Studies based on absolute measures of productivity of incumbents in particular jobs that pay the same wage to everyone with equal tenure find it has a coefficient of variation of 20 percent (Schmidt and Hunter, 1983). The respondent should be asked to make a self-assessment of their effort on the job and of their productivity. Question wording might be something like: "Relative to the other employees at the firm, how much harder or less hard did you work? How do you think your supervisor assessed your productivity relative to the other employees doing similar work?" If a tradeoff is necessary reduce the number questions of satisfaction and probabilities of taking particular kinds of jobs.
- Consideration should be given to obtaining permission from students to speak to their employer or supervisor and then asking the supervisor for an assessment of how the individual's productivity and capabilities compare with other employees.

### Data for Studies of School Improvement

Studies of how schools evolve require data sets with repeated measures of school climate and school processes. Such data sets are very expensive to create, however, because the key climate and process variables cannot be measured without interviewing large samples of teachers and students at each school. A recent survey of 10,360 teachers which measured school climate and processes at 500 high schools cost more than \$200,000 to conduct. Longitudinal data on school climate and process can be made available at no additional cost simply by returning to these 500 schools in the NELS88 and repeating some of the same questions in the survey of teachers.

### Data for Studies of Learning in Elementary Schools and Junior High Schools

Longitudinal data sets that start when the child is very young and follow him/her all the way through school and into the labor market would make possible a number of very valuable studies:

- Long term effects of early childhood education and types of special education services
- Elementary school effectiveness
- Junior high school effectiveness
- Retention in high school through the 10th grade. Most dropouts leave school before the end of their sophomore year and so are not part of the NELS88 baseline.
- Evolution of career awareness and aspirations prior to 10th grade.

Consideration should therefore be given to, starting in 1988, a longitudinal survey of second graders and their parents in a sample of the elementary schools that feed into the high schools selected for NELS88. The parent child data would then be merged with school records on grades and aptitude and achievement test scores and surveys of the principals and teachers of the school attended. These students would then be resurveyed in 1992 and 1996 and serve as the sophomore cohort of NELS96.

Another way a longitudinal data set might be developed would be to undertake a followup of the 1st through 3rd grade children who participated in the

Sustaining Effects Study in 1975 through 1978. An additional requirement would be surveys of the principals and teachers in the elementary and secondary schools attended by these students and the development of a mechanism for matching each student to the teachers that he/she had. Even if no further augmentation of the Sustaining Effects data is planned there would be significant benefits to making a well documented version of the data set more widely available through NCES.

## FOOTNOTES

1. Awarding a high school diploma to a student who cannot read or write, may make that individual better off but it depreciates the value of the diploma for everyone else and lowers the efficiency of the process which matches individuals to jobs.

2. The IEA data comparing the U.S. and other countries first became available in the early 70s. To my knowledge these data never appeared in an NCES publication until after the report of the National Commission on Excellence in Education. If these statistics had been appearing regularly in publications like The Condition of Education, the nation's attention might have been directed to the problem of declining standards much sooner than it was.

3. NELS88 is a better vehicle for studying the effects of school process and climate on student outcomes because the school process and climate variables will be measured when the students are sophomores rather than 2 years after graduation as in the case of HSB.

4. High school juniors and seniors average more than 10 hours a week in paid employment during the school year. Time engaged in a learning activity averaged under 20 hours (Bishop, 1985; p. 9).

5. An alternative might be to add the questions about school background to a month that already has the weekly earnings data such as May or January. The March Survey is already too crowded to be considered for this purpose.

6. The source of these estimates is an off the record conversation with a former Census Bureau staff member).

7. At present the Digest of Education Statistics does not contain such data (see table 1).

8. The CPS question on state in which one received one's high school education described in the previous section would allow the construction of similar tables using CPS data that would assign migrants to the state where they received their education rather than their state of residence.

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